

## EDITORIAL ARTICLES.

### GUEILLIOT ON THE CONTAGION OF CANCER.<sup>1</sup>

M. O. GUEILLIOT has made a careful study of this subject, reviewing the literature and examining the sections of France where cancer seems to be more prevalent than in other places, with a view to determining whether the facts sustain the possibility of the disease being contagious. He first defines contagion as "the act by which a specific disease is communicated from an infected individual to a healthy one, either by direct or by indirect contact."

In opposition to the views of Virchow, Cornil and Ranvier, and in accordance with those held by Waldeyer, Robin and Lancereux, he contends that the epithelial origin of cancer is being more and more admitted, and in this study he considers carcinoma and epithelioma identical.

In the last century cancer cases were refused admission to the Hotel Dieu, at Rheims, and a special hospital was constructed in the city for the care of this class of cases, but the neighbors raised so much objection, declaring that the disease was contagious and consequently a menace to the neighborhood, that it was removed outside of the city limits. It was not until 1841 that cancer subjects were admitted to the San Marcoul Hospital in separate wards. Velpeau considered that although the contagion of cancer was not proven it was still possible. In 1885 John Hall reported five cases where cancer attacked both husband and wife, and T. Barthélemy insisted upon the possibility of the inoculation of cancer in old cutaneous lesions, and Ledoux-Lebard published a remarkable work on the parasitic nature of cancer. In 1887 there appeared simultaneously in England, America and France several observations on the subject, but it remained for Dr. Arnaudet, of Cormeilles, to indicate the proper

<sup>1</sup> Gazette des Hôpitaux, 139, 1892.

method which should be pursued in order to arrive at proper results. He studied the topography and chronology of cancer, first, in his own and then in neighboring villages, and expressed the opinion that cancer is contagious, and that it is transmissible through the medium of water and habitation.

Gueilliot reports the case of a husband and wife and servant who died of cancer within a few years of one another, and in 1889 the Medical Society of Rheims took up the investigation. In 1891 M. Gueilliot addressed a letter to physicians, asking them to furnish him with all the statistics they had in their possession bearing upon the subject, and he received many replies, so that he presents in this paper the statistics furnished by thirty unpublished cases, in addition to those already placed on record. Fabre, who also made a study of this subject, has stated that "the contagion of cancer is possible, and can be explained through the grafting of a cancerous cell upon a healthy organism." Bazin has insisted that gouty subjects are particularly prone to cancer, especially of the rectum and the bladder, and Verneuil and Bouchard have made similar statements. Heredity has been given too much importance in the etiology of cancer, and it is responsible for only about ten to fifteen per cent. of the cases, leaving from eighty-five to ninety per cent. whose cause must be determined.

Cancer usually appears as a tumor growing at the place of origin, without at first having any effect on the general organism, which becomes infected secondarily, so that there is first localization and then propagation. It first spreads by continuity from cell to cell, and is then carried to a distance by the lymphatics and the veins.

If we agree with Odenius, Bard and Brault that the cancerous cellule is the agent of infection, the whole evolution of the disease is easily understood; thus, too, the different forms that it assumes may be explained. According to some opinions cancer is a general disease from the outset, and the tumor is only a localized manifestation of it, consequently surgical intervention is useless, save as a palliative measure; others consider that the disease is at first local, and this

local grafting produces a true infection which finally ends in the cachexia.

It was supposed in 1887, when Rappin announced the discovery of the cancer microbe, that the origin of the disease was explained, but so far this discovery has not been confirmed. The parasite of cancer is not a microbe, but it is a sporozoa or psorosperm. These have been observed by numerous investigators; other histologists deny the parasitical character of these psorosperms, and assert that they are only cellular modifications, while still another class consider that a coccus exists, but that its presence has no connection with the evolution of the disease.

Wehr inoculated dogs with carcinoma taken from an animal of the same species, and found at the autopsy a cancer of the retro-peritoneal glands. Hanan in 1887 grafted pieces of epithelioma of the vulva taken from a rat into the vaginal walls of other animals of the same species, and not only obtained an evolution of the disease at this spot, but also secondary centres in the peritonæum, and he was able then to inoculate a second series. Morau's results are particularly conclusive. He grafted in the axilla and on the groin of mice fragments of a cylindrical epithelioma taken from another mouse, and produced a tumor of similar character. New grafts were made with the secondary neoplasms, generalization took place, and he continued his experiments to the eighteenth consecutive graft. Later on he showed some mice in whom the grafted tumor remained passive during gestation, but grew rapidly after confinement. Up to the present time no attempt to graft cancer from man to an animal, or from one animal to another of different species has been successful, except in some cases reported in a preliminary paper to the Royal Academy of Belgium, July 30, 1892, where human cancer had been successfully grafted upon some white mice.

Observation proves that a traumatism, a superficial lesion of the skin or of the mucous membrane, or an erosion, may be the starting point for a malignant neoplasm. Cancer does not appear in the normal skin, because there is no irritation. It appears as though the

place of entry must be open for a certain time, as inoculation proceeds slowly. If, as in syphilis or tuberculosis, we admit of the possibility of external inoculation, all would be very easily explained. The cancerous germ comes in contact with a fissured surface more or less denuded of its epithelium and grafts itself there, growing with more or less rapidity. The most likely places for this to occur are the margins of the orifices where there are two membranes of different structure, or where the circulation is very active. The period of incubation is generally very long, and where the germs have engrafted themselves on an open wound they may remain quiescent for a long time, when through the influence of age and general enfeeblement of the constitution the spot becomes favorable for their development.

Clinical experience has also demonstrated the possibility of auto-inoculation of malignant tumors. Velpeau has seen a secondary nodule appear in the vagina at the level of a cancer of the neck of the uterus and recur five times, and this condition is confirmed by Gueilliot, Kraske, Albarron, Devic and Chatin.

A septuagenarian, a great smoker, who had a cancer just starting at the base of the tongue, was seen a few months ago, but he refused an operation, and was not seen again until some time later, when the tumor had doubled in size, ulcerated badly, and a budding ulceration, evidently epitheliomatous, had formed on the corresponding anterior pillar of the fauces and neighboring portion of the cheek, so that the two ulcerations were absolutely symmetrical and superimposed.

The secondary nodules in the skin following the puncture of a cancerous ovarian cyst have been observed (Waldeyer, Nicaise, Quincke, Terrillon), and it is a question whether cutaneous relapses after the removal of cancer, particularly of the breast, may not be simply grafts which have occurred at the operation. At any rate, it would be prudent to avoid, so far as possible, the *morcellement* of these tumors.

E. Hahn, in 1886, having chloroformed a woman suffering from an inoperable cancer of the breast, cut out three fragments from this tumor and transplanted them into the other breast. The woman died three

months later from a generalization of the cancer, and the histological examination showed that the nodules developed at the inoculated points had the same structure as the original tumor. Bergmann confesses to having repeated Hahn's experiments. Many consider that generalization is simply a graft, and since 1878 Cohnheim and Maas have admitted that metastasis was due to a proliferation of cancerous emboli.

We have personally had during the past year a case of recurrent cancer of the breast which was being treated by injections of pyoktannin. For a considerable period the growth seemed to be arrested, but finally, and almost simultaneously, there appeared a tumor in the opposite breast, another in the lung of the side originally affected, another in the right lobe of the liver, and also one on the left side, apparently in connection with the stomach, and a week or two later the patient developed cerebral symptoms that seemed to point to a tumor of the brain. We felt that this generalization of the cancer must have been due to the liberation of cancer elements by the needle which, being taken up by the blood and lymph currents, were deposited in the different organs that were affected secondarily.

Virchow and Paget have found coagula in the veins containing epithelia, and the study of cancerous lymphangitis apparently confirms this view.

That a cancer cannot be grafted upon a person already afflicted with the disease does not prove that this attempt might not be more successful upon a well person, but the success of animal inoculations renders the possibility of human inoculation probable. To succeed, however, the same precautions must be observed as in inoculating animals, and especially to choose receptive subjects who are old and present the proper conditions for the reception of the disease.

In Paris 104 people die of cancer on an average out of every 100,000 inhabitants, and a study of the locality of the disease is very peculiar, and has not varied in twenty years. Thus the poor districts of Gobelins and the Observatory give an average of 137-145 deaths from this cause, while the richer and more cleanly districts of the Pantheon and the Elysee give but 75.

The same ratio is found in the other large cities, Rouen and Rheims. In Lyons the average reaches 163. Formerly there was a tendency to believe that cancerous affections were rare in the country, but it is now known to be very common, and in certain villages its ravages are absolutely appalling. At St. Sylvestre de Corneilles, a little village of Normandy, the ratio of deaths from this disease is 345 to every 100,000 inhabitants—three times greater than in Paris; at St. Leonard, the ratio is 200; at Ardennes, 266; but the largest is that reported by Dr. Manichou, of Oulchy-le-Chateau. In twenty years there were 864 deaths from cancer in seventeen communes of his practice, the entire population of which was only 3,000. This gives an annual mortality of 1,400 per 100,000.

Although heredity and consanguinity play an important rôle in the development of cancerous taints, they are not sufficient to explain this great disparity in the ratio of different localities. Thus in M. Manichou's practice the infected villages were all north of the river Ourcq, while another village where the infection has been studied by M. Duplee was isolated. These facts lead to the question whether there may not be some condition of the soil or of the water, or that some topographical cause may be responsible for the propagation of the disease. In order to obtain more precise information the observations must be limited to a single quarter, or a single group of houses. Thus in 1880 M. Arnaudet reported the death of a man from cancer of the stomach who lived on the plateau of St. Sylvestre. In 1884 another patient living on the side of the hill died from the same cause, and in 1885 two others who lived at the foot of the hill were carried off in the same way, while in 1887 the fifth member of this group, who lived in a house adjoining that in which the first case was observed, succumbed to the same disease. There was no heredity in these cases, and such an accumulation of cases living within 300 miles of one another would naturally suggest some local cause. The cancer traveled regularly from the top to the bottom of the hill, and the water supply might have been suspected except for the fact that none of the patients were water drinkers, but M. Arnaudet suspected

the cider which was made from the water of the pools. Some time after publishing this series of cases the same observer found a cancer of the breast in the wife of one of these peasants.

The study of another cancerous locality in a street in Corneilles allowed Dr. Arnaudet to carry his investigation into the etiology of the disease still farther. In thirty years seventeen houses out of fifty-four furnished twenty-one cases of cancer, and some of the houses about half way up the street seemed to form a nest for tumors. In 1884 five cases were attacked at about the same time. Here the water might be suspected, but the dwelling must also be taken into consideration, and it is probably the fact that this condition of infected habitations may often be the true cause of cases that are considered hereditary. In 1891 the same surgeon reported a new series of observations confirming the common action of dwelling and water in the production of cancer, and he then presents the following conclusions :

(1) The great frequency of cancer in country places indicated that there is some cause for the disease outside of the organism.

(2) Water is the most common medium of inoculation, as is proven by the numerous cases found on plateaus, where there is not a pure water supply.

(3) The germ is carried to dwellers in the same house directly or indirectly through objects contaminated by former patients.

Another example is furnished by M. Firssinger, at Oyonnax, where three or four cancerous patients died yearly out of a population of 4,500 housed in 500 dwellings. Here a group of three houses at the end of the village supplied in four years four patients, not including one case of osteo-sarcoma. These people were strangers to each other, and there was no hereditary predisposition. The disease seems to have been imported into the village by a woman who arrived in 1886 and who had a cancer of the breast, and who was in the habit of throwing her soiled dressings out of her front door. She died in 1887, and the next year a tenant in the same house died of cancer of the penis, and two years later another died of cancer of the rectum,

while in 1888 a neighbor was attacked with cancer of the stomach. M. Roy, of St. Martin-de-Re, also reports an instance where in less than two years three neighbors died of cancer of the breast, stomach and rectum.

In a little village of the Ardennes Gueilliot saw first a man die of cancer of the rectum in 1870, the wife succumbing to cancer of the breast in 1873, and the servant from the same disease the same year, while the father-in-law died of cancer of the rectum in 1875. Blyth tells of three persons becoming cancerous in the same house, and a friend who often visited them contracting the disease. The niece of the latter was also infected. Lucas has also seen three deaths in the same house within a few years. Other cases might be cited, but we have quoted enough for our present purposes.

In other cases the communication is more direct, as in husband and wife both dying of cancer within a short time of each other.

Altogether seventy-seven cases have been collected—In seventy-one, the two affected were husband and wife ; in six, two persons living together, master and servant.

In nineteen the cancer affected the same organ in both—Stomach eleven times : mouth four times ; integuments twice.

In fifty-eight it attacked different organs, and among these are indicated twenty-three where the cancer appeared in the penis of the husband following uterine cancer in the woman. This proportion is very surprising, and proves that the rarity of bisexual cancer is more apparent than real. The long period of incubation of cancer probably explains the almost universal opinion against the danger of conjugal intercourse when the uterus is the seat of epithelioma. Demarquay, it is true, out of 134 cases of cancer of the penis, only once found a cancer of the uterus in the wife, but Gaillard Thomas has recognized the danger of the inoculation of cancer under these conditions.

These examples, then, are in favor of the contagion of cancer by direct contact, inoculation or grafting. Delbet reported to the Anatomical Society the case of a child dying of general cancer. Its



mother had nursed it, although she had a tumor of the breast. A surgeon of Dorset (Emson) died of cancer eight months after having pricked his finger while operating on a malignant tumor.

But in most cases a single contact is not sufficient.

Nothing favors contagion more than promiscuous intercourse and habitation.

Richard Budd has reported that five surgeons of the cancer hospital (North Devon Infirmary) who died in succession of this disease contracted it from their patients.

Contagion seems also to be carried by soiled linen and objects of common use. M. Dève gives the history of a young man of 38 having no hereditary taint who was attacked with cancer of the tongue. Some years previously his father-in-law had died of an epithelioma that originated in the nose, and finally covered the face and the superior maxilla. The son-in-law had been in the habit of smoking his father-in-law's pipes. M. Molliere also had a similar case, except that here there may have been an hereditary predisposition in the younger man, as his sister died of cancer some years later.

It is possible that the germ of cancer can live outside of the organism, like the germ of typhoid fever, cholera, anthrax and others. Hidden in those excellent breeding places, water and soil, or lodged in the nooks and corners of a house, it may at the favorable moment be absorbed and become the starting point of the disease. It is probably often introduced by drinking, for it is epidemic about the ponds of Normandy and Champagne, and it is especially frequent on the marshy plateau of Rocroi. M. Ballance says that in England it seems especially prevalent along the courses of rivers subject to periodical overflows. This idea agrees with Metchnikoff's theory that the coccus gives birth to spores which develop outside of the human system, and that eventually cancer will be considered as a miasmatic disease.

The incubation, judging from our observations, may be of variable duration. In forty-three cases the exact dates are noted. In these the interval between the deaths of the two patients was :

One year and some months,	sixteen times.
Two years,	six “
Three “	five “
Four “	twice.
Five “	“
Five to ten years,	nine times.
Ten to fifteen “	three “

It is seen then that thirty-one patients died during the five years following the death of the first case. There is nothing surprising in the long incubation noted in the long cases, as they belong to incomplete observations, and even in heredity the same thing is noticed.

There is in both hereditary and acquired cancer a longer or shorter period of incubation, which Prosper Lucas calls the “occultation of morbid phenomena.” The latent period is often shorter in the acquired than in the hereditary cases. In one-third of the former it does not exceed one year.

The contagion is undoubtedly slight, or, as Velpeau puts it, “it is not easy,” it requires a receptive condition, which fortunately is not often found.

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#### IVERSON ON PERI-UTERINE SUPPURATION.

PROF. A. IVERSON, of Copenhagen,<sup>1</sup> has contributed an interesting study of this subject, together with a tabulation of cases, which is worthy of reproduction here. He says that whenever the uterus, tubes and ovaries are inflamed that portion of the peritonæum surrounding them is also affected. It was formerly necessary, in order to obtain an explanation of pelvic inflammations in women, to make an exploratory laparotomy, but the increased knowledge obtained in consequence of these salpingo-oöphorectomies of the pathological conditions has enabled observers at the present time to make more accurate diagnoses than formerly. It is still a question how the disease

<sup>1</sup> Deutsche Medicinische Wochenschrift, October 6, 1892; October 13, 1892; October 20, 1892; October 27, 1892, and November 3, 1892.